



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,525	07/24/2002	Naoki Tamitani	SOEI/0016	5906
7590 04/19/2004				
Moser Patterson & Sherdian Suite 1500 3040 Post Oak Boulevard Houston, TX 77056			EXAMINER CHEN, KIN CHAN	
			ART UNIT 1765	PAPER NUMBER
DATE MAILED: 04/19/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/030,525

Applicant(s)

TAMITANI ET AL.

Examiner

Kin-Chan Chen

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11-03-03 6) ☐ Other:

### **DETAILED ACTION**

1. The cancellation of claims 18-20 is acknowledged.

#### ***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure. The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited.

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

#### ***Drawings***

4. The drawings (Figs 3A, 3B, 5A, 5B, 6A, 6B, and 7) are required in this application because only Figs. 1A, 1B, 2A, 2B, and 4 have been received in the application. The drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Downey et al. (US 6,194,323; hereinafter "Downey") in view of Muller et al. (US 6,252,284; hereinafter "Muller") or S. Wolf (Silicon processing, vol. 2, pp. 298-299).

In a method of forming metal wirings for a semiconductor device, Downey teaches that a metal film may be formed. A hard mask, with a film thickness of at least 150 nm but not greater than 300 nm, may be formed. The hard mask may contain a silicon inorganic insulating film and the hard mask may have pattern. The metal film may be etched with the hard mask by use of an etching gas to form metal wiring of the pattern. Hard mask may be silicon oxide (claims 2, 14). Metal film may be Al, Al alloy, tungsten or copper alloy (claims 3, 4), etching gas may be chlorine-containing gas (claim 10), see abstract; col. 3, lines 8-14, lines 57-65; col. 4, lines 4-28.

Downey teaches the process may be used for the production of semiconductor device comprising depositing metal layer (abstract). Downey is not particular about the semiconductor device. Hence, it would have been obvious to one with ordinary skill in the art to apply the process to MOSFET because MOSFET is one of the most popular

Art Unit: 1765

semiconductor devices. Muller or S. Wolf is only relied on to show the MOSFET, which comprises the metal wirings of a pattern, connected through a conduction path to a control electrode on an insulating layer formed on a substrate. Because it is conventional device and because it is disclosed by Muller" or S. Wolf, hence, it would have been obvious to one with ordinary skilled in the art to use the process of Downey to fabricate MOSFET in order to fabricate the desired device.

Downey teaches that the process parameters may vary depending on the equipment and system (col. 4 and Tables). Hence, it would have been obvious to one with ordinary skilled in the art to optimize the process through routine optimization such that the amount of electric charge in the metal film is decreased when forming the metal wiring to reduce the occurrence of the breakdown and deterioration in order to produce the desired product.

The above-cited claims differ from the prior art by specifying well-known features (such as forming the barrier material; forming an antireflection film) to the art of semiconductor device fabrication. It is the examiner's position that a person having ordinary skill in the art at the time of the claimed invention would have found it obvious to modify the combined prior art by adding any of same well-known features to same in order to provide their art recognized advantages and produce an expected result.

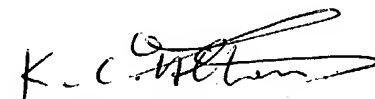
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's

Art Unit: 1765

supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-0988.

April 5, 2004

  
Kin-Chan Chen  
Primary Examiner  
Art Unit 1765